

REMARKS

Claims 1 through 20 are pending in this Application of which claims 1 through 11 stand withdrawn from consideration pursuant to the provisions of 37 C.F.R. § 1.142(b). Accordingly, claims 12 through 20 are active.

Claims 12 and 15 have been amended to address formalistic issues identified by the Examiner, notably an antecedent basis issue on claim 12 and a typographical oversight in claim 15. In addition new claim 20 has been added. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, paragraph [15] appearing at page 3 of the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue.

Claim objection.

The Examiner objected to claim 15 identifying a grammatical oversight. In response claim 15 has been amended consistent with the Examiner's suggestion, thereby overcoming the stated basis for the claim objection. Accordingly, withdrawal of the objection to claim 15 is solicited. The Examiner's perspicacity is appreciated.

Claims 12 through 19 were rejected under the second paragraph of 35 U.S.C. § 112.

In the statement of rejection the Examiner identified a perceived literal antecedent basis issue. This rejection is traversed.

Initially, the mere assertion of a literal lack of antecedent basis does not automatically trigger a rejection under the second paragraph of 35 U.S.C. § 112 which is a legal question. *Bose*

Corporation v. JBL, Inc., 274 F.3d 1354, 61 USPQ2d 1216 (Fed. Cir. 2001). Clearly, one having ordinary skill in the art would have no difficulty understanding the scope of the claimed invention particularly when reasonably interpreted in light of and consistent with the written description of the specification, as the Examiner has done in the second full paragraph on page 3 of the September 22, 2004 Office Action. Accordingly, the Examiner's approach constitutes evidence that one having ordinary skill in the art would understand the claimed invention.

At any rate, in order to expedite prosecution, claim 12 has been amended to address the antecedent basis issue mentioned by the Examiner, thereby overcoming the stated basis for the imposed rejection under the second paragraph of 35 U.S.C. § 112. One having ordinary skill in the art would have no difficulty understanding the scope of the claimed invention, particularly when reasonably interpreted in light of and consistent with the written description of the specification which is the judicial standard. *Miles Laboratories, Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993).

Applicants, therefore, submit that the imposed rejection of claims 12 through 19 under the second paragraph of 35 U.S.C. § 112 is not legally viable and, hence, solicit withdrawal thereof.

Claims 12 through 15 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Alluri et al. in view of Cheung.

In the statement of the rejection the Examiner admitted that Alluri et al. do not disclose a semiconductor device comprising a silicon-rich silicon oxide layer having a refractive index (R.I.) greater than 1.6 on an upper surface of the interlayer dielectric, as in the claimed invention. The Examiner then concluded one having ordinary skill in the art would have been motivated to modify

the semiconductor device disclosed by Alluri et al. by forming the silicon-rich silicon oxide layer with a R.I. greater than 1.6 to provide a moisture barrier. This rejection is traversed.

There is no inherency.

Significantly, the Examiner never asserted that Alluri et al. disclose a semiconductor device comprising a silicon-rich silicon oxide layer inherently having a R.I. greater than 1.6. Indeed, the Examiner admitted that Alluri et al. do not disclose any such silicon-rich silicon oxide layer.

For emphasis, Applicants would point out that inherency requires certainty, not a mere possibility or speculation. *Crown Operations International Ltd. v. Solutia Inc.*, 289 F.3d 1367, 62 USPQ2d 1917 (Fed. Cir. 2002); *Finnegan Corp. v. ITC*, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); *In re Rijckaert*, 9 F.3d 1531, 28 USPQ2d 1955 (Fed. Cir. 1993); *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991). No such certainty can be derived from Alluri et al. who disclose a virtual laundry list of possible materials to serve as the "... **optional** semiconductor-containing source layer 32 ..." (column 2 of Alluri et al., lines 31 and 32; Emphasis supplied). Thus, for starters, layer 32 is **optional**. If employed, it can be virtually any material which contains an excess of semiconductor atoms, inclusive of "... silicon, germanium, carbon, tin, **or the like**" (column 2, line 35; Emphasis supplied). Silicon-rich silicon nitride, silicon-rich silicon oxide and silicon-rich silicon oxynitride layers are disclosed along with amorphous silicon. The amount of semiconductor atoms may be 3-95 at.% of the layer. How that translates to any R.I. has not been factually established on this record even if, and that is a big matter of selectivity, silicon-rich silicon oxide is selected. Clearly, the **degree of selectivity** required to arrive at even a silicon-rich silicon oxide layer scotches the factual determination that Alluri et al.

inherently, i.e., **necessarily**, disclose a silicon-rich silicon oxide layer as in the claimed invention, let alone one with a R.I. greater than 1.6. On this issue the Examiner is apparently in agreement.

There is no motivation.

In order to establish the requisite motivation the Examiner must make clear and particular factual findings as to a specific understanding or specific technological principle and then, based upon such facts, explain **why** one having ordinary skill in the art would have been realistically motivated to modify particular prior art, in this case the **particular** semiconductor device disclosed by Alluri et al. to arrive at the claimed invention. *In re Lee*, 237 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002); *Ecolochem Inc. v. Southern California Edison, Co.*, 227 F.3d 1361, 56 USPQ2d 1065 (Fed. Cir. 2000); *In re Kotzab*, 217 F.3d 1365, 55 USPQ 1313 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). The Examiner's reasoning is that a silicon-rich silicon oxide layer containing an appropriately adjusted amount of silicon can be formulated with a high R.I. to provide a moisture barrier. The Examiner refers to Cheung. There are several problems with the Examiner's analysis and approach.

Firstly, Alluri et al. address the specific problem of "... oxidation of conductive plugs that are used to electrically connect the capacitors with other circuitry within the semiconductor device" (column 1, lines 24 through 27). No such capacitor structure is disclosed by Cheung. Therefore, one having ordinary skill in the art would have had no reason to run to Cheung to address any issue or problem relating to Alluri et al.

The optional semiconductor-containing source layer 32 is employed by Alluri et al. is used to diffuse excess dopant atoms upward along grain boundaries of the lower electrode layer 52 during an anneal cycle (column 3, lines 63 through 66). What impact the Examiner's proposed

modification of optional layer 32 has on this objective of Alluri et al. is anybody's guess. But fact-based reasoning is required to establish motivation – not guesswork. *In re Lee, supra; Ecolochem Inc. v. Southern California Edison, Co., supra; In re Kotzab, supra; In re Dembiczak, supra; In re Rouffet, 149 F.3d 1350, 47 USPQ2d 1453 (Fed. Cir. 1998).*

Cheung, on the other hand, is directed to protecting metal interconnects using a moisture barrier. That is quite a different objective from that of Alluri et al. which is to prevent oxidation at a particular place wherein a lower electrode of a **capacitor** is electrically connected to a conductive plug. At this point, again, the layer in question is used for **doping** not for protection. The Examiner's attempt to convert the doping layer 32 of the device disclosed by Alluri et al. into an overall moisture barrier to fortuitously (maybe) achieve a third result, i.e., UV opaqueness to prevent undesirable UV charging, an objective which is not even a blip on the radar screen of either Alluri et al. or Cheung et al., is improperly motivated by Applicants' disclosure. *Panduit Corp. v. Dennison Mfg. Co., 774 F.2d 1082, 227 USPQ 337 (Fed. Cir. 1985).* Accordingly, Applicants submit that the Examiner did not establish the requisite fact-based reasoning to support the asserted motivational element.

The problem element.

The problem element impacts the obviousness conclusion in several ways. Firstly, as held by the Court of Appeals for the Federal Circuit in *Ecolochem Inc. v. Southern California Edison, Co. at 56 USPQ2d 1065*:

... there still must be evidence that "a skilled artisan, confronted with the same problem as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed." *In re Rouffet, 149 F.3d at 1357, 47 USPQ2d at 56*; see also *In re Warner Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000).*

Neither of the applied references addresses the UV charging problem addressed and solved by the claimed invention. Accordingly, the motivational element fails the judicial test announced by *Ecolochem Inc. v. Southern California Edison, Co., supra*.

Secondly, the problem element is a factor which must be given consideration as an indicium of **nonobviousness**. See, for example, *North American Vaccine, Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993); *Northern Telecom, Inc. v. Datapoint Corp.*, 908 F.2d 931, 15 USPQ2d 1321 (Fed. Cir. 1990); *In re Newell*, 891 F.2d 899, 13 USPQ2d 1248 (Fed. Cir. 1989); *In re Nomiya*, 509 F.2d 566, 184 USPQ 607 (CCPA 1975). Again, in the present situation, neither of the applied references expresses any recognition of the problem of UV charging during back end of line processing, which is the problem addressed and solved by the claimed invention.

Thirdly, there is no dispute on this record that Applicants discovered that UV radiation generated during back end line processing, such as deposition, metal etching, and passivation, particularly plasma processing, undesirable charges cells, thereby increasing the program voltage of the cells. This is disclosed in paragraph [14] appearing at page 3 of the written description of the specification. Thus, Applicants have discovered the **source** of the problem which is a further **indicium of nonobviousness**. *In re Sponnoble*, 405 F.2d 578, 160 USPQ 237 (CCPA 1969).

Conclusion

Based upon the foregoing Applicants submit that a *prima facie* basis to deny patentability to the claimed invention has not been established for lack of the requisite factual basis and want of the requisite realistic motivation. Moreover, upon giving due consideration to the potent **indicia of nonobviousness** stemming from the problem addressed and solved by the claimed invention, and Applicants' discovery of the source of the problem, the conclusion appears inescapable that one

having ordinary skill in the art would **not** have found the claimed invention as a **whole** obvious within the meaning of 35 U.S.C. § 103. *In re Piasecki*, 745 F.2d 1468, 223 USPQ 785 (Fed. Cir. 1984).

Applicants, therefore, submit that the imposed rejection of claims 12 through 15 under 35 U.S.C. § 103 for obviousness predicated upon Alluri et al. in view of Cheung is not factually or legally viable and, hence, solicit withdrawal thereof.

Claims 16 through 19 were rejected under 35 U.S.C. § 103 for obviousness predicated upon Alluri et al. in view of Cheung, Weimer and Wolf et al.

In the statement of rejection the Examiner concluded that one having ordinary skill in the art would have been motivated to modify whatever semiconductor device can be said to have been suggested by the combined disclosures of Alluri et al. and Cheung by forming a transistor having a tunnel oxide, floating gate, ONO stack and a control gate in view of Weimer so that it would be shielded from moisture presumably employing the optional dopant-containing layer 32 employed by Alluri et al. (for a different purpose), and then to employ silicon oxide spacers in view of Wolf et al. This rejection is traversed.

Firstly, claims 16 through 19 depend from independent claim 12. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 12 under 35 U.S.C. § 103 for obviousness predicated upon Alluri et al. in view of Cheung. The additional references to Weimer and Wolf et al. do not cure the previously argued deficiencies in the attempted combination of Alluri et al. and Cheung. Moreover, Applicants separately argue the patentability of claims 16 through 19.

Specifically, claims 16 through 19 underscore the particular problem addressed and solved by the claimed invention. The Examiner's combination of four references to somehow back into a situation in which the problem addressed and solved by the claimed invention is created and solved, using references which express no appreciation for the problem, suggests improper alliance upon Applicants' disclosure. *Panduit Corp. v. Dennison Mfg. Co., supra.*

Applicants, therefore, submit that the imposed rejection of claims 16 through 19 under 35 U.S.C. § 103 for obviousness predicated upon Alluri et al. in view of Cheung, Weimer and Wolf et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

New claim 20.

New claim 20 is clearly free of the applied prior art by virtue of its dependence upon independent claim 16, which in turn depends upon independent claim 12, the patentability of both claims having previously been argued. Accordingly, claim 20 is free of the applied prior art for reasons previously argued. Moreover, Applicants separately argue the patentability of claim 20 which states that the silicon-rich silicon oxide layer is substantially opaque to UV radiation. This requirement underscores the problem addressed and solved by the claimed invention, which problem is not appreciated by any of the applied references, thereby underscoring the nonobviousness of the claimed invention as a whole.

Based upon the foregoing it should be apparent that the imposed objection and rejections have been overcome and that all pending claims are in condition for immediate allowance. Favorable consideration is, therefore, solicited.

No.: 10/617,451

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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